STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor Sara Parker Pauley, Director
DEPARTMENT OF NATURAL RESOURCES
dnr.mo.gov

April 1, 2013

Ms. Kimberly Strader, City Clerk
City of Bolivar
345 South Main Ave
P.O. Box 9
Bolivar, MO 65613

Dear Permittee:

Missouri State Operating Permit MO-0022373 issued on April 4, 2008 is hereby modified as per the enclosed. This modification is to include new outfall location and ultraviolet disinfection. The enclosed permit is for your official record.

Please read your permit and enclosed Standard Conditions. They contain important information on monitoring requirements, effluent limitations, sampling frequencies and reporting requirements.

This permit is both your Federal Discharge Permit and your new State Operating Permit and replaces all previous State Operating Permits for this facility. In all future correspondence regarding this facility, please refer to your State Operating Permit number and facility name as shown on page one of the permit.

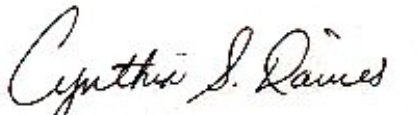
Please be aware that nothing in this permit relieves the permittee of any other legal obligations or restrictions, such as other federal or state laws, court orders, or county or other local ordinances or restrictions.

If you were adversely affected by this decision, you may be entitled to an appeal before the administrative hearing commission pursuant to 10 CSR 20-1.020 and Section 621.250, RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission. Any appeal shall be directed to: Administrative Hearing Commission, Truman Building, Room 640, 301 W. High Street, P.O. Box 1557, Jefferson City, MO 65102, Phone: 573-751-2422, Fax: 573-751-5018, website: www.oa.mo.gov/ahc.

If you have any questions concerning this permit please contact Mr. Sieu T. Dang, P.E., of my staff by calling 417-891-4300 or via mail at Southwest Regional Office, 2040 W. Woodland, Springfield, MO 65807-5912.

Sincerely,

SOUTHWEST REGIONAL OFFICE



Cynthia S. Davies
Regional Director

CSD/sdk

Enclosures

c: Mr. T.J. Whatley, P.E., Olsson Associates
Mr. Chris Wieberg, Water Protection Program
Mr. Robert J. Brundage, Newman, Cromley & Ruth P.C.

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0022373
Owner:	City of Bolivar
Address:	345 S. Main Avenue, Bolivar, MO 65613
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Bolivar WWTF
Facility Address:	1801 E. Broadway, Bolivar, MO 65613
Legal Description:	NE ¼, SW ¼, Sec. 6, T33N, R22W, Polk County
UTM (X/Y):	465817 / 4163555
Receiving Stream:	Town Branch of Piper Creek (P)
First Classified Stream and ID:	Piper Creek (P) (01444) 303(d) list
USGS Basin & Sub-watershed No.:	(10290107-0303)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 – POTW – SIC #4952

Influent pumps, primary screening, grit removal, parallel oxidation ditches, two final clarifiers, ultraviolet light disinfection, sludge storage tanks. Sludge is land applied. Disinfection and New Outfall 001 will be installed and in operation prior to June 28, 2013.

This facility requires a Class B operator.

Design population equivalent is 25,365.

Design flow is 2.55 million gallons per day.

Actual flow is 1.4 million gallons per day.

Design sludge production is 533 dry tons/year.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

April 4, 2008 — Effective Date

April 1, 2013 — (Revised)

Sara Parker Pauley, Director, Department of Natural Resources

April 3, 2013 — Expiration Date

Cynthia S. Davies, Regional Director, Southwest Regional Office

Outfall S1 – Instream Monitoring
Existing Outfall 001, approximately 470 yards upstream of the new outfall 001
Legal Description: NW ¼, SW ¼, Sec. 6, T33N, R22W, Polk County
UTM(x, y): 465552 / 4163363
Receiving Stream: Town Branch of Piper Creek (P) 303(d)
First Classified Stream and ID: Town Branch of Piper Creek (P) (1444)
USGS Basin & Sub-watershed No.: (10290107-0303)

Outfall S2 – Instream Monitoring
Division Street Bridge, approximately 200 feet downstream of the new outfall 001
Legal Description: NE ¼, SW ¼, Sec. 6, T33N, R22W, Polk County
UTM(x, y): 465860 / 4163573
Receiving Stream: Town Branch of Piper Creek (P) 303(d)
First Classified Stream and ID: Town Branch of Piper Creek (P) (1444)
USGS Basin & Sub-watershed No.: (10290107-0303)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001						
Flow	MGD	*		*	once/week	24 hr. total
Biochemical Oxygen Demand$_5$	mg/L		45	30	once/week	24 hr. composite**
Total Suspended Solids	mg/L		41	27	once/week	24 hr. composite**
pH – Units	SU	***		***	once/week	grab
E. coli (Note 1)	#/100 ml		1030	206	once/week	grab
Ammonia as N	mg/L				once/week	grab
(April 1 – Sept 30)		3.7		1.4		
(Oct 1 – March 31)		8.1		3.1		
Oil & Grease	mg/L	15		10	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE **May 28, 2013.** THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Whole Effluent Toxicity (WET) test	% Survival	See Special Conditions			once/year	24 hr. composite
MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE **October 28, 2008**						
Outfall #S1 & S2						
Dissolved Oxygen	mg/L	*			once/quarter*** *	grab
Total Suspended Solids	mg/L	*			once/quarter****	grab
Total Phosphorus	mg/L	*			once/quarter****	grab
Total Nitrogen	mg/L	*			once/quarter****	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE **July 28, 2008**						

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I, II, & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

MO 780-0010 (8/91)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.

** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

*** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.5-9.0 pH units.

**** Sample once per quarter in the months of April, May, June, July, August, September, and October. Reports shall be submitted by the 28th day of the month following sample collection (eg. sample collected in April, report due by May 28th).

Note 1 - Final limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday). Limits for *E. Coli* will become effective June 28, 2013.

C. INFLUENT MONITORING REQUIREMENTS

The facility is required to meet a removal efficiency of 85% or more. The monitoring requirements shall become effective upon issuance and remain in effect until expiration of the permit. To determine removal efficiencies, the influent wastewater shall be monitored by the permittee as specified below:

SAMPLING LOCATION AND PARAMETER(S)	UNITS	MONITORING REQUIREMENTS	
		MEASUREMENT FREQUENCY	SAMPLE TYPE
Influent			
Biochemical Oxygen Demand$_5$	mg/L	once/month	24 hr. composite**
Total Suspended Solids	mg/L	once/month	24 hr. composite**

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE **May 28, 2008**

MO 780-0010 (8/91)

** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

D. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
   (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
   (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

   The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls must be clearly marked in the field.

3. Permittee will cease discharge by connection to area-wide wastewater treatment system within 90 days of notice of its availability.

4. Changes in Discharges of Toxic Substances

   The permittee shall notify the Director as soon as it knows or has reason to believe:
   (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
      (1) One hundred micrograms per liter (100 µg/L);
      (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
      (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
      (4) The level established in Part A of the permit by the Director.
   (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

5. Report as no-discharge when a discharge does not occur during the report period.

6. Sludge and Biosolids Use For Domestic Wastewater Treatment Facilities
   (a) Permittee shall comply with the pollutant limitations, monitoring, reporting, and other requirements in accordance with the attached permit Standard Conditions.

D. SPECIAL CONDITIONS (continued)

(b) If sludge is not removed by a contract hauler, permittee is authorized to land apply biosolids. Permit Standard Conditions, Part III shall apply to the land application of biosolids. The department may require submittal of a biosolids management plan for department review and approval as determined appropriate on a case-by-case basis.

7. The permittee shall comply with any applicable requirements listed in 10 CSR 20-8 and 10 CSR 20-9, unless the facility has received written notification that the Department has approved a modification to the requirements. The monitoring frequencies contained in this permit shall not be construed by the permittee as a modification of the operational monitoring frequencies listed in 10 CSR 20-9. If a modification of the operational monitoring frequencies listed in 10 CSR 20-9 is needed, the permittee shall submit a written request to the department for review and, if deemed necessary, approval.

8. **Wet Weather Bypass Sampling** – A sample shall be collected of each discharge during a bypass event at the treatment facility, including shut down of rotors on oxidation ditches. Each bypass discharge shall be analyzed for Biochemical Oxygen Demand$_5$ and Total Suspended Solids. If the rotors are shut off, sampling shall occur immediately before the rotors are turned back on. The data shall be reported on the monthly Discharge Monitoring Reports. This condition does not apply to dry weather bypass events, which shall be reported in accordance with Standard Conditions Part 1, Section B, item 2.

9. The permittee shall develop and implement a program for maintenance and repair of the collection system.

10. The City is allowed to discharge at the existing outfall 001 until the new outfall is completed and placed in operation by June 28, 2013.

11. Water Quality Standards
   (a) Discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
   (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
      (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
      (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
      (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
      (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
      (5) There shall be no significant human health hazard from incidental contact with the water;
      (6) There shall be no acute toxicity to livestock or wildlife watering;
      (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
      (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

12. Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF WET TESTING FOR THIS PERMIT				
OUTFALL	A.E.C. %	FREQUENCY	SAMPLE TYPE	MONTH
001	100	once/year	24 hr. composite	September

   (a) Test Schedule and Follow-Up Requirements
      (1) Perform a SINGLE-dilution test in the months and at the frequency specified above. For tests which are successfully passed, submit test results USING THE DEPARTMENT'S WET TEST REPORT FORM #MO-780-1899 along with complete copies of the test reports as received from the laboratory, including copies of chain-of-custody forms

D. SPECIAL CONDITIONS (continued)

within 30 calendar days of availability to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102. If the effluent passes the test, do not repeat the test until the next test period.

(a) For discharges of stormwater, samples shall be collected within three hours from when discharge first occurs.
(b) Samples submitted for analysis of stormwater discharges shall be collected as a grab.
(c) For discharges of non-stormwater, samples shall be collected only when precipitation has not occurred for a period of forty-eight hours prior to sample collection. In no event shall sample collection occur simultaneously with the occurrence of precipitation excepting for stormwater samples.
(d) A twenty-four hour composite sample shall be submitted for analysis of non-stormwater discharges.

(e) Upstream receiving water samples, where required, shall be collected upstream from any influence of the effluent where downstream flow is clearly evident.
(f) Samples submitted for analysis of upstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
(g) Chemical and physical analysis of the upstream control and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping.
(h) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analyses performed upon any other effluent concentration.
(i) All chemical analyses included in the Missouri Department of Natural Resources WET test report form #MO-780-1899 shall be performed and results shall be recorded in the appropriate field of the report form.
(j) Where flow-weighted composite sample is required for analysis, the samples shall be composited at the laboratory where the test is to be performed.
(k) Where in stream testing is required downstream from the discharge, sample collection shall occur immediately below the established Zone of Initial Dilution in conjunction with or immediately following a release or discharge.
(l) Samples submitted for analysis of downstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
(m) All instream samples, including downstream samples, shall be tested for toxicity at the 100% concentration in addition to any other assigned AEC for in-stream samples.

(2) All failing test results along with complete copies of the test reports as received from the laboratory, INCLUDING THOSE TESTS CONDUCTED UNDER CONDITION (3) BELOW, shall be reported to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.

(3) If the effluent fails the test, a multiple dilution test shall be performed for BOTH test species within 30 calendar days and biweekly thereafter (for storm water, tests shall be performed on the next and subsequent storm water discharges as they occur), until one of the following conditions are met:
(a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
(b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.

(4) Failure of at least two multiple-dilution tests during any period of accelerated monitoring violates the permit narrative requirement for aquatic life protection.

(5) The permittee shall submit a concise summary of all test results for the test series to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.

(6) Additionally, the following shall apply upon failure of the third MULTIPLE DILUTION test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall contact THE WATER PROTECTION PROGRAM within 14 calendar days from availability of the test results to ascertain as to whether a TIE or TRE is appropriate. The permittee shall submit a plan for conducting a TIE or TRE to the WATER PROTECTION PROGRAM within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.

(7) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.

D. SPECIAL CONDITIONS (continued)

(8) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.

(9) When WET test sampling is required to run over one DMR period, each DMR report shall contain a copy of the Department's WET test report form that was generated during the reporting period.

(10) Submit a concise summary in tabular format of all test results with the annual report.

(b) PASS/FAIL procedure and effluent limitations:

(1) To pass a single-dilution test, mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other Federal guidelines as appropriate or required.

(2) To pass a multiple-dilution test:

(a) For facilities with a computed percent effluent at the edge of the zone of initial dilution, Allowable Effluent Concentration (AEC) OF 30% OR LESS, the AEC must be less than three-tenths (0.3) of the LC_{50} concentration for the most sensitive of the test organisms; **OR**,

(b) For facilities with an AEC greater than 30% the LC50 concentration must be greater than 100%; **AND**,

(c) all effluent concentrations equal to or less than the AEC must be nontoxic. Mortality observed in all effluent concentrations equal to or less than the AEC shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other federal guidelines as appropriate or required. Failure of one multiple-dilution test may be considered an effluent limit violation.

(c) Test Conditions

(1) Test Type: Acute Static non-renewal.

(2) All tests, including repeat tests for previous failures, shall include both test species listed below.

(3) Test species: Ceriodaphnia dubia and Pimephales promelas (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS.

(4) Test period: 48 hours at the "Acceptable Effluent Concentration" (AEC) specified above.

(5) When dilutions are required, upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.

(6) Single-dilution tests will be run with:

(a) Effluent at the AEC concentration;

(b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and

(c) reconstituted water.

(7) Multiple-dilution tests will be run with:

(a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;

(b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and

(c) reconstituted water.

(8) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.

(9) If upstream control mortality exceeds 10%, the entire test will be rerun using reconstituted water as the dilutant.

SUMMARY OF TEST METHODOLOGY FOR WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR, the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms,

Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test acceptability criterion:	90% or greater survival in controls

Test conditions for (Pimephales promelas):

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test Acceptability criterion:	90% or greater survival in controls

E. RECEIVING WATER MONITORING CONDITIONS

1. Instream samples should be taken at the established locations noted on page 2. In the event that a safe, accessible location is not present at this location, a suitable location can be negotiated with the department. Samples should be taken at least four feet from the bank or from the middle of the stream (whichever is less) and 6-inches below the surface. The upstream receiving water sample should be collected at a point upstream from any influence of the effluent, where the water is visibly flowing down stream.

2. When conducting in-stream monitoring, the permittee shall record observations that include: the time of day, weather conditions, unusual stream/lake characteristics (e.g., septic conditions, algae growth, etc.), the stream segment (e.g., riffle, pool or run) or the lake depth from where the sample was collected. These observations shall be submitted with the sample results.

3. Samples shall not be collected from areas with especially turbulent flow, still water or from the stream bank, unless these conditions are representative of the stream reach or no other areas are available for sample collection. Sampling should not be made when significant precipitation has occurred recently. The sampling event should be terminated and rescheduled if any of the following conditions occur:
   - If turbidity in the stream increases notably; or
   - If rainfall over the past two weeks exceeds 2.5 inches or exceeds 1 inch in the last 24 hours

4. Always use the correct sampling technique and handling procedure specified for the parameter of interest. Please refer to the latest edition of Standard Methods for the Examination of Water and Wastewater for further discussion of proper sampling techniques. All analyses must be conducted in accordance with an approved EPA method. Meters shall be calibrated immediately (within 1 hour) prior to the sampling event.

5. To obtain accurate measurements, D.O., temperature and pH analyses should be performed on-site in the receiving stream where possible. However, due to high flow conditions, access, etc., it may be necessary to collect a sample in a bucket or other container. When this is necessary, care must be taken not to aerate the sample upon collection. If for any reason samples must be collected from an alternate site from the one listed in the permit, the permittee shall report the location with the sample results.

6. Dissolved oxygen measurements are to be taken during the period from one hour prior to sunrise to one and one-half hour after sunrise.

7. Please contact the department if you need additional instructions or assistance.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF MODIFICATION
OF
MO-0022373
BOLIVAR WWTF

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of storm water from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (department) under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)2.] a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (operating permit) listed below.

A Factsheet is not an enforceable part of an operating permit.

This Factsheet is for a Major ☒, Minor ☐, Industrial Facility ☐; Variance ☐;
Master General Permit ☐; General Permit Covered Facility ☐; and/or permit with widespread public interest ☐.

Part I – Facility Information

Facility Address: 1801 East Broadway, Bolivar, MO 65613
Facility Type: POTW
Facility SIC Code(s): 4952

Facility Description: 2.5 MGD. Influent pumps, primary screening, grit removal, parallel oxidation ditches, two final clarifiers, ultraviolet light disinfection, sludge storage tanks. Sludge is land applied.

Last Inspection: July 24, 2012 In Compliance ☐; Non-Compliance ☒

The Inspection Report documented the failure of the City of Bolivar to comply with effluent limitations, inadequate laboratory procedures, failure to properly operate and maintain the wastewater treatment facility, and reported Sanitary Sewer Overflows.

CERTIFIED OPERATOR
This facility requires a class B operator. Score = 52

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	3.95	Secondary	Domestic, Municipal	0.0

Comments:
This is for a modification to include ultraviolet (UV) disinfection system and relocation of the outfall 001 approximately 1,400 feet downstream from the existing location. A draft of the MSOP for UV disinfection was placed on public notice on November 18, 2011 and ended December 18, 2011. No comment was received during the public notice and the construction permit CP000991 for the UV system was issued on December 29, 2011. Since the revised plans and specifications on August 10, 2012 for the redesigned of the UV disinfection also include the relocation of outfall 001 and since relocation of the outfall is considered a major modification, this operating permit is placed back for public comment. The outfall is to be removed from its current location so that additional hydraulic head can be available for gravity discharge through the current UV disinfection equipment and the future filtration process to address potential phosphorus limitations.

Outfall #001
Legal Description: NE ¼, SW ¼, Sec. 6, T33N, R22W, Polk County
UTM(x, y): 465817 / 4163555
Receiving Stream: Town Branch of Piper Creek (P) 303(d)
First Classified Stream and ID: Town Branch of Piper Creek (P) (1444)
USGS Basin & Sub-watershed No.: (10290107-0303)

Outfall S1 – Instream Monitoring
Old Outfall 001, approximately 470 yards upstream of the new outfall 001
Legal Description: NW ¼, SW ¼, Sec. 6, T33N, R22W, Polk County
UTM(x, y): 465552 / 4163363
Receiving Stream: Town Branch of Piper Creek (P) 303(d)
First Classified Stream and ID: Town Branch of Piper Creek (P) (1444)
USGS Basin & Sub-watershed No.: (10290107-0303)

Outfall S2 – Instream Monitoring
Division Street Bridge, approximately 200 feet downstream of the new outfall 001
Legal Description: NE ¼, SW ¼, Sec. 6, T33N, R22W, Polk County
UTM(x, y): 465860 / 4163573
Receiving Stream: Town Branch of Piper Creek (P) 303(d)
First Classified Stream and ID: Town Branch of Piper Creek (P) (1444)
USGS Basin & Sub-watershed No.: (10290107-0303)

Part II – Receiving Stream Information

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:
As per Missouri's Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the below listed seven (7) categories. Each category list effluent limitations for specific parameters, which are presented in each outfall's Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

Please mark the correct designated waters of the state categories of the receiving stream.

Missouri or Mississippi River [10 CSR 20-7.015(2)]:	Yes ☐; No ☒
Lake or Reservoir [10 CSR 20-7.015(3)]:	Yes ☐; No ☒
Losing [10 CSR 20-7.015(4)]:	Yes ☐; No ☒
Metropolitan No-Discharge [10 CSR 20-7.015(5)]:	Yes ☐; No ☒
Special Stream [10 CSR 20-7.015(6)]:	Yes ☐; No ☒
Subsurface Water [10 CSR 20-7.015(7)]:	Yes ☐; No ☒
All Other Waters [10 CSR 20-7.015(8)]:	Yes ☒; No ☐

10 CSR 20-7.031 Missouri Water Quality Standards, the department defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 1st classified receiving stream's beneficial water uses to be maintained are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(3)].

RECEIVING STREAM(S) TABLE:

The classified receiving stream described in state regulations is erroneously called Piper Creek until its confluence with the real Piper Creek. Please see the "**Total Maximum Daily Load Information Sheet**" attached at the end of this Fact Sheet for full details.

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	8-DIGIT HUC	EDU**
Town Branch of Piper Creek	P	1444	AQL, LWW, WBC-B***	10290107	Ozark/Osage

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND).
** - Ecological Drainage Unit
*** - UAA conducted on 7-14-05 and disapproved on 9-7-05.

RECEIVING STREAM(S) LOW-FLOW VALUES TABLE:

RECEIVING STREAM (U, C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Town Branch of Piper Creek (P)	0.1	0.1	1.0

MIXING CONSIDERATIONS TABLE:

MIXING ZONE (CFS) [10 CSR 20-7.031(4)(A)4.B.(II)(a)]			ZONE OF INITIAL DILUTION (CFS) [10 CSR 20-7.031(4)(A)4.B.(II)(b)]		
1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
0.025	0.025	0.25	0.0025	0.0025	0.025

RECEIVING STREAM MONITORING REQUIREMENTS:

Site S1. (Upstream)

PARAMETER(S)	SAMPLING FREQUENCY	SAMPLE TYPE	LOCATION
Dissolved Oxygen	once/quarter	grab	Old Outfall 001, approximately 470 yards upstream of the new outfall 001
Total Suspended Solids			
Total Phosphorus			
Total Nitrogen			

Site S2. (Downstream)

PARAMETER(S)	SAMPLING FREQUENCY	SAMPLE TYPE	LOCATION
Dissolved Oxygen	once/quarter	grab	Division Street Bridge, approximately 200 feet downstream of the new outfall 001
Total Suspended Solids			
Total Phosphorus			
Total Nitrogen			

The closest cross road where the City would have access is approximately 200 feet downstream of the outfall. The next closest public access road that crosses this waterway is approximately 7,000 feet downstream. The property along the waterway in between is privately owned. Therefore, the 200 feet downstream location was chosen.

Part III – Rationale and Derivation of Effluent Limitations & Permit Conditions

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:
As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

Not Applicable ☒;
The facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(36)] & [10 CSR 20-7.031(1)(N)], or is an existing facility.

ANTI-BACKSLIDING:
A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(I)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

☒ - All limits in this Factsheet are at least as protective as those previously established; therefore, backsliding does not apply.

ANTIDEGRADATION:
In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)], the department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

☒ - Applicable; Please see the file for the completed antidegradation waiver signed by the engineer of record and owner for the installation of ultraviolet light disinfection system and Antidegradation Applicability Review for City of Bolivar WWTF letter dated December 11, 2012.

APPLICABLE PERMIT PARAMETERS:
Effluent parameters contained in Factsheets and Missouri State Operating Permits are obtained from Technology Based Effluent Limit (TBEL), Missouri's Effluent Regulations [10 CSR 20-7.015], Missouri's Water Quality Standards [10 CSR 20-7.031], previous Missouri State Operating Permits, and from Operating Permit Applications.

BIO-SOLIDS, SLUDGE, & SEWAGE SLUDGE:
Bio-solids are solid materials resulting from wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sludge is any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works.

Applicable (renewal and modifications to existing operating permits) ☒;
This facility has been approved to land apply as per Permit Standard Conditions III and a department approved bio-solids management plan.

COMPLIANCE AND ENFORCEMENT:
Action taken by the department to resolve violations of the Missouri Clean Water Law, its implementing regulations, and/or any terms and condition of an operating permit.

Applicable ☒;
The permittee/facility is currently under enforcement action with the U.S. EPA.

PRETREATMENT PROGRAM:
The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a Publicly Owned Treatment Works [40 CFR Part 403.3(q)].

Not Applicable ☒;
At this time, the permittee is not required to implement and enforce a Pretreatment Program.

REASONABLE POTENTIAL ANALYSIS (RPA):
Limitations must control all pollutants or pollutant parameters that are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above the Missouri Water Quality Standards.

Not Applicable ☒;
A RPA was not conducted for this facility.

REMOVAL EFFICIENCY:
Removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to Biochemical Oxygen Demand 5-day (BOD_5) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs). Please see the United States Environmental Protection Agency's (EPA) website for interpretation of percent removal requirements for National Pollutant Discharge Elimination System Permit Application Requirements for Publicly Owned Treatment Works and Other Treatment Works Treating Domestic Sewage @ www.epa.gov/fedrgstr/EPA-WATER/1999/August/Day-04/w18866.htm

Applicable ☒;
Secondary Treatment is 85% removal [40 CFR Part 133.102(a)(3) & (b)(3)].

SANITARY SEWER OVERFLOWS (SSOS), AND INFLOW & INFILTRATION (I&I):
Collection systems are a critical element in the successful performance of the wastewater treatment process. Under certain conditions, poorly designed, built, managed, operated, and/or maintained systems can pose risks to public health, the environment, or both. Causes of SSOs include, but are not limited to, the following: high levels of I&I during wet weather; blockages; structural, mechanical, or electrical failures; collapsed or broken sewer pipes; insufficient conveyance capacity; and vandalism. Effective and continuous management, operation, and maintenance, as well as ensuring adequate capacity and rehabilitation when necessary are critical to maintaining collection system capacity and performance while extending the life of the system.

Not Applicable ☒;
This facility is not required to develop or implement a program for maintenance and repair of the collection system; however, it is a violation of Missouri State Environmental Laws and Regulations to allow untreated wastewater to discharge to waters of the state.

The City is required under an administrative order from the U.S. EPA to reduce I&I. The order has specific requirements and a timeline for accomplishing those requirements.

SCHEDULE OF COMPLIANCE (SOC):
A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit.

Not Applicable ☒;

STORM WATER POLLUTION PREVENTION PLAN (SWPPP):
A plan to schedule activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the state. The plan may include, but is not limited to, treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Not Applicable ☒;
At this time, the permittee is not required to develop and implement a SWPPP.

VARIANCE:
As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.

Not Applicable ☒;
This operating permit is not drafted under premises of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:
As per [10 CSR 20-2.010(78)], the amount of pollutant each discharger is allowed by the department to release into a given stream after the department has determined to total amount of pollutant that may be discharged into that stream without endangering its water quality.

Applicable ☒;
Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)}$$ (EPA/505/2-90-001, Section 4.5.5)

Where C = downstream concentration
Cs = upstream concentration
Qs = upstream flow
Ce = effluent concentration
Qe = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

WLA MODELING:

Not Applicable ☒;
A WLA study was either not submitted or determined not applicable by department staff.

WHOLE EFFLUENT TOXICITY (WET) TEST:
As per [10 CSR 20-7.031(1)(CC)], a toxicity test conducted under specified laboratory conditions on specific indicator organism; and as per [40 CFR Part 122.2], the aggregate toxic effect of an effluent measured directly by a toxicity test.

Applicable ☒;
Effective July 15, 2005, upon revision, renewal, modification, or issuance, all Missouri State Operating Permits under the NPDES will incorporate use of the following guidelines for determining the applicability and requirements for WET testing. WET testing requirements are established by the WET Test Policy, Section 308 of the Federal Water Pollution Control Act, and [40 CFR § 136]. Please check WET tests applicability for this facility:

- All major discharge facilities ☒;
- Facilities that are exceeding or routinely exceed their design flow ☐;
- Most municipals, domestic sewage dischargers ☒;
- Industrial dischargers or other dischargers that may alter their production processes throughout the year ☐;
- Facilities that may handle large quantities of toxic substances, or substances that are toxic in large amounts ☐; and
- Facilities that have been granted seasonal relief of numeric limitations ☐.

303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):
Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed that shall include the TMDL calculation

Applicable ☒;
Piper Creek (Town Branch) is listed on the 1998 and 2006 Missouri 303(d) Lists for organic sediment and unknown pollutants, respectively. Please see the "**Total Maximum Daily Load Information Sheet**" attached at the end of this Fact Sheet for full details.

☒ – This facility is considered to be one of the sources of the above listed pollutant(s) or considered to contribute to the impairment. New waste load allocations may be developed as part of a TMDL. Major contributions to the impairment are believed to be from upstream sources within Bolivar city limits. Once these are determined and addressed, necessary action at the treatment facility will be determined.

Part IV – Effluent Limits Determination

Outfall #001 – Main Facility Outfall

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	GPD	1	*		*	NO	*
BOD_5	MG/L	1		45	30	NO	
TSS	MG/L	1, 3		41	27	NO	
PH (S.U.)	SU	1	6.6 -9.0		6.5-9.0	YES	6.0-9.0
TEMPERATURE (°C)	°C	REMOVED	--		--	YES	*
AMMONIA AS N (APRIL 1 – SEPT. 31)	MG/L	2, 3	3.7		1.4	YES	FOR MAY 1 – OCT. 1
AMMONIA AS N (OCT. 1 – MARCH 31)	MG/L	2, 3	8.1		3.1	YES	FOR NOV 1 – APRIL 30
FECAL COLIFORM	**	REMOVED	--		--	YES	1000/400
E. COLI	**	1, 2, 3		1030	206	YES	***
OIL & GREASE (MG/L)	MG/L	2, 3	15		10	NO	
WHOLE EFFLUENT TOXICITY (WET) TEST	Please see WET Test in the Derivation and Discussion Section below.						

* - Monitoring requirement only.
** - # of colonies/100mL; the Monthly Average for Fecal Coliform is a geometric mean.
*** - Parameter not previously established in previous state operating permit.

Basis for Limitations Codes:

1. State or Federal Regulation/Law
2. Water Quality Standard (includes RPA)
3. Water Quality Based Effluent Limits
4. Lagoon Policy
5. Ammonia Policy
6. Antidegradation Policy
7. Water Quality Model
8. Best Professional Judgement
9. TMDL or Permit in lieu of TMDL
10. WET test Policy

OUTFALL #001 – DERIVATION AND DISCUSSION OF LIMITS:

- **Biochemical Oxygen Demand (BOD_5).** Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.** No change has been proposed in this modification.

- **Total Suspended Solids (TSS).** Effluent limitations have been retained from previous state operating permit. No change has been proposed in this modification

- **pH.** pH is limited to the range of 6.5 – 9.0 pH units, as per [10 CSR 20-7.031(4)(E)]. pH is measured in pH units and is not to be averaged.

- **Temperature.** Temperature has been removed because it is no longer pertinent in determining ammonia limitations.

- **Total Ammonia Nitrogen**. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L.

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

Summer: April 1 – September 30, Winter: October 1 – March 31

Summer: April 1 – September 30

Chronic WLA: $C_e = ((3.95 + 0.25)1.5 – (0.25 * 0.01))/3.95$

$C_e = 1.6$ mg/L

Acute WLA: $C_e = ((3.95 + 0.0025)12.1 – (0.0025 * 0.01))/3.95$

$C_e = 12.1$ mg/L

LTA_c = 1.6 mg/L (0.780) = 1.2 mg/L [CV = 0.6, 99th Percentile, n = 30]
LTA_a = 12.1 mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]

MDL = 1.2 mg/L * 3.11 = 3.7 mg/L [CV = 0.6, 99th Percentile]
AML = 1.2 mg/L * 1.19 = 1.4 mg/L [CV = 0.6, 95th Percentile, n = 30]

Winter: October 1 – March 31

Chronic WLA: $C_e = ((3.95 + 0.25)3.1 – (0.25 * 0.01))/3.95$
$C_e = 3.3$ mg/L

Acute WLA: $C_e = ((3.95 + 0.0025)12.1 – (0.025 * 0.01))/3.95$
$C_e = 12.1$ mg/L

LTA_c = 3.3 mg/L (0.780) = 2.6 mg/L [CV = 0.6, 99th Percentile, n = 30]
LTA_a = 12.1 mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]

MDL = 2.6 mg/L * 3.11 = 8.1 mg/L [CV = 0.6, 99th Percentile]
AML = 2.6 mg/L * 1.19 = 3.1 mg/L [CV = 0.6, 95th Percentile, n = 30]

- **Fecal Coliform**. *E. Coli* has replaced fecal coliform at the applicable bacteria in Missouri's water quality standards.

- ***Escherichia coli (E. coli)***. Monthly average of 206 per 100 ml as a geometric mean and Weekly Average of 1030 during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (B) designated use of the receiving stream, as per 10 CSR 20-7.031(4)(C). Weekly Average effluent variability will be evaluated in development of a future effluent limit. An effluent limit for both monthly average and weekly average is required by 40 CFR 122.45(d).

- **Oil & Grease**. Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum. No change has been proposed in this modification.

- **WET Test**. No change to the Wet Test has been proposed in this modification. Whole Effluent Toxicity test shall be conducted as follows:

Summary of Wet Testing for This Permit				
Outfall	A.E.C. %	Frequency	Sample Type	Month
001	100	Once/year	24 hr. composite	September

PART V: Finding of Affordability

Pursuant to Section 644.145, RSMo., the Department is required to determine whether a permit or decision is affordable and makes a finding of affordability for certain permitting and enforcement decisions. This requirement applies to discharges from combined or separate sanitary sewer systems or publically-owned treatment works.

☒ Not Applicable; The Department is not required to determine findings of affordability because the permit contains no new conditions or requirements that convey a new cost to the facility.

Part VI – Administrative Requirements

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

PERMIT SYNCHRONIZATION:
The Department of Natural Resources is currently undergoing a synchronization process for operating permits. Permits are normally issued on a five-year term, but to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is that all permits within a watershed will move through the Watershed Based Management (WBM) cycle together will all expire in the same fiscal year. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also allow the department to explore a watershed based permitting effort at some point in the future.

PUBLIC NOTICE:
The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing.

The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

☒ - The Public Notice period for this operating permit was from January 11, 2013 to February 10, 2013. Responses received were beyond the scope of this modification and will be considered at the renewal of this permit.

DATE OF FACTSHEET: OCTOBER 11, 2011 REVISED JANUARY 3, 2013 AND MARCH 28, 2013

COMPLETED BY:

Sieu T. Dang, P.E.,
WP Permitting and Assistance Unit
(417) 891-4300
Sieu.dang@dnr.mo.gov

Part VII – Appendices

APPENDIX #A - CLASSIFICATION WORKSHEET:

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
Maximum Population Equivalent (P.E.) served (Max 10 pts.)	1 pt./10,000 PE or major fraction thereof.	3
Maximum: 10 pt Design Flow (avg. day) or peak month; use greater (Max 10 pts.)	1 pt. / MGD or major fraction thereof.	3
EFFLUENT DISCHARGE RECEIVING WATER SENSITIVITY:		
Missouri or Mississippi River	0	
All other stream discharges except to losing streams and stream reaches supporting whole body contact	1	
Discharge to lake or reservoir outside of designated whole body contact recreational area	2	
Discharge to losing stream, or stream, lake or reservoir area supporting whole body contact recreation	3	3
PRELIMINARY TREATMENT – Headworks		
Screening and/or comminution	3	3
Grit removal	3	3
Plant pumping of main flow (lift station at the headworks)	3	
PRIMARY TREATMENT		
Primary clarifiers	5	
Combined sedimentation/digestion	5	
Chemical addition (except chlorine, enzymes)	4	
REQUIRED LABORATORY CONTROL – performed by plant personnel (highest level only)		
Push – button or visual methods for simple test such as pH, Settleable solids	3	
Additional procedures such as DO, COD, BOD, titrations, solids, volatile content	5	5
More advanced determinations such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc.	7	
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph	10	
ALTERNATIVE FATE OF EFFLUENT		
Direct reuse or recycle of effluent	6	
Land Disposal – low rate	3	
High rate	5	
Overland flow	4	
Total from page **ONE (1)**	----	20

APPENDIX #A - CLASSIFICATION WORKSHEET (CONTINUED):

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
VARIATION IN RAW WASTE (highest level only) (DMR exceedances and Design Flow exceedances)		
Variation do not exceed those normally or typically expected	0	
Recurring deviations or excessive variations of 100 to 200 % in strength and/or flow	2	2
Recurring deviations or excessive variations of more than 200 % in strength and/or flow	4	
Raw wastes subject to toxic waste discharge	6	
SECONDARY TREATMENT		
Trickling filter and other fixed film media with secondary clarifiers	10	
Activated sludge with secondary clarifiers (including extended aeration and oxidation ditches)	15	15
Stabilization ponds without aeration	5	
Aerated lagoon	8	
Advanced Waste Treatment Polishing Pond	2	
Chemical/physical – without secondary	15	
Chemical/physical – following secondary	10	
Biological or chemical/biological	12	
Carbon regeneration	4	
DISINFECTION		
Chlorination or comparable	5	
Dechlorination	2	
On-site generation of disinfectant (except UV light)	5	
UV light	4	4
SOLIDS HANDLING - SLUDGE		
Solids Handling Thickening	5	5
Anaerobic digestion	10	
Aerobic digestion	6	
Evaporative sludge drying	2	
Mechanical dewatering	8	
Solids reduction (incineration, wet oxidation)	12	
Land application	6	6
Total from page **TWO (2)**	----	32
Total from page **ONE (1)**	---	20
Grand Total	---	52

☐ - A: 71 points and greater
☒ - B: 51 points – 70 points
☐ - C: 26 points – 50 points
☐ - D: 0 points – 25 points

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Town Branch of Piper Creek (or Piper Creek)

Water Body Segment at a Glance:

County: Polk
Nearby Cities: Bolivar
Length of impairment: 0.5 miles
Pollutant: Volatile Suspended Solids (VSS)
Source: Bolivar Wastewater Treatment Facility (WWTF)


State map showing location of watershed

TMDL Priority Ranking: High

Description of the Problem

Beneficial uses of Piper Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Human Health Protection (Fish Consumption)
- Whole Body Contact Recreation – Category B

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

- Standards for Volatile Suspended Solids may be found in the general criteria section of the Missouri Water Quality Standards (WQS), 10 CSR 20-7.031(3)(A) and (C) where it states:
  - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
  - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

Background Information and Water Quality Data

Town Branch of Piper Creek is called Piper Creek on the 303(d) list. This is due to an error regarding its location as listed in the WQS and will be corrected to Town Branch in a future WQS revision. The creek was placed on the 303(d) list because it showed an accumulation of "objectionable solids" downstream from the Bolivar Wastewater Treatment Facility (WWTF) in 1993. Volatile suspended

solids (VSS) refer to organic (not sand or mineral) particles that are suspended in water, like algae, or those that settle out, like the sewage sludge in Piper Creek. When these solids settle onto the streambed, they smother natural substrates (materials in the streambed), aquatic invertebrate animals (like crayfish and water insects) and fish eggs.

Three studies by the department of deposition of solids in Town Branch and Piper Creek began in 2003. Two of the studies characterize the impacts to the stream related to fine sediment deposition and organic solids. One was completed in 2004 and the other in 2006 (data are shown in the Table 2). While the 2004 results did not indicate a significant VSS impairment due to the treatment plant, the 2006 results did. The notable differences during both survey periods between the upstream and downstream (of the WWTF) sites in Town Branch indicate that the WWTF is a significant source of impairment. One possible explanation for this difference is the relatively lower streams flow in the 2006 study compared to the 2004 study. Lower stream flows allow more buildup of solid material over time, intensifying the VSS impairment. The bioassessment portion of the studies indicates the aquatic community is somewhat impaired due to the WWTF. The scores in Table 1 are stream condition index (SCI) scores. Streams with scores of 14 or lower are considered impaired. The sediment studies also reported heavy growth of algae both up and downstream of the plant, indicating the WWTF is not the only source of the impairment.

Therefore, the TMDL will need to identify other possible sources of nutrients (the likely cause of the excess algal growth), besides the WWTF. These would be nonpoint sources (from stormwater runoff in general) and could include fertilizer from lawns and agricultural lands or leaking septic systems, among many other things. The bioassessment study recommends the use of best management practices inside and outside of Bolivar city limits of to help control nonpoint source pollution. The local community within the Piper Creek watershed has organized as the Bolivar Community Watershed Improvement Group (BC WIG) to find ways to remediate the problem(s). Some of the actions they have taken so far include removing the city compost pile from the creek's flood plain and having the creek tested for bacteria. High levels were found upstream, as well as downstream, of the WWTF. The group has also formulated a monitoring plan for Town Branch and Piper Creek, which they are using to collect more data so they can more accurately identify sources of nutrients.

Table 1. Aquatic Invertebrate Community Scores from the Bioassessment

Location	WBID	Based on EDU	Reference Streams	Based on Local	Small Streams
		Fall 2003	Spring 2004	Fall 2003	Spring 2004
Piper Cr. above Town Br.	U	10	12	10	10
Town Br. 0.1 mi. above Bolivar WWTP	1444	14	8	10	8
Town Br. 0.5 mi. below Bolivar WWTP	1444	10	10	10	10
Piper Cr. 1.7 mi. below Bolivar WWTP	1444	14	12	10	10

Note: Using either the Ecological Drainage Unit (EDU) or Local Reference Streams, 6 of 6 scores are 14 or less. This does not include the scores for the Unclassified part of Piper Creek (U). The Listing Methodology Document states that for 7 or fewer scores, at least 75% of the scores must be 14 or less for the water to be judged impaired. Based this criterion and the above scores, the 1.8 mile segment of WBID 1444 (from 0.1 mile upstream of the Bolivar WWTF to 1.7 miles downstream of the WWTF) is judged to be impaired.

Table 2. Results from the "Sediment" Studies, 2004-2006

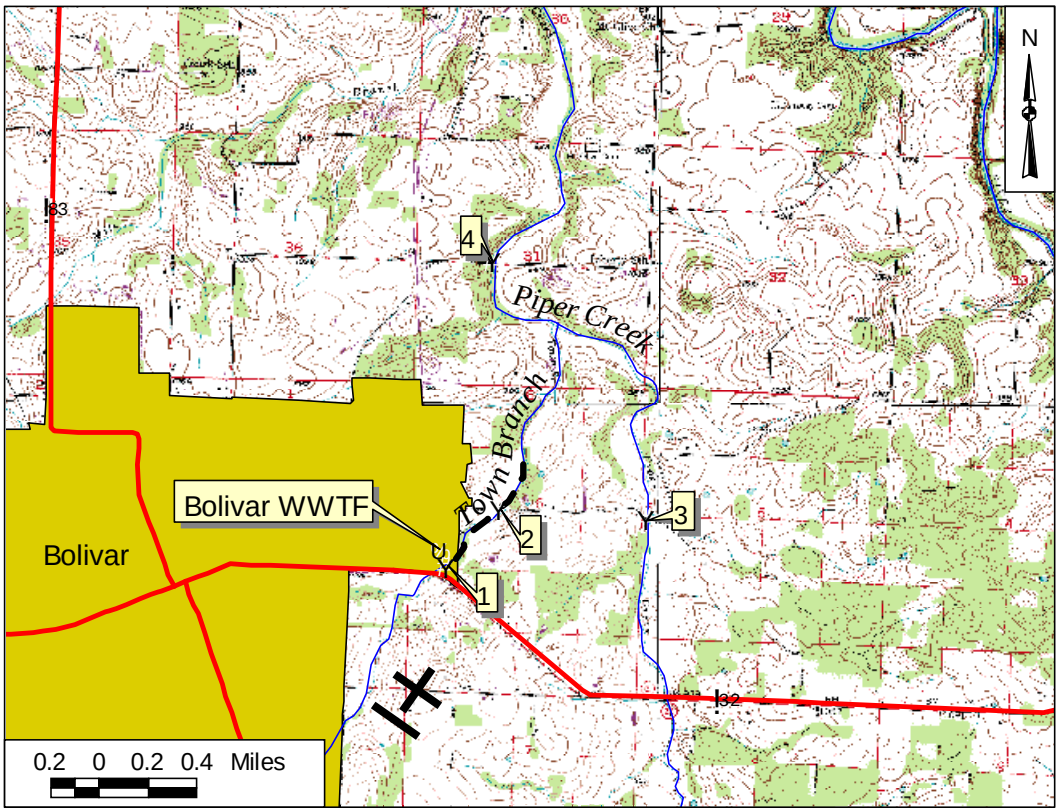
		Piper Cr. Above Town Br.			Town Br. Above WWTP			Town Br. Below WWTP			Piper Cr. Below Town Br.		
Year	Mo	BOD	TSS	VSS	BOD	TSS	VSS	BOD	TSS	VSS	BOD	TSS	VSS
2004	3	69	7760	670	46	1520	160	69	2730	250	60	1410	210
2004	3	50	860	85	70	2110	250	69	1870	320	69	2390	250
2004	3	67	11200	880	61	1670	160	69	2080	330	48	352	76
2004	3										69	1120	200
2004	5	32	25100	330	21	1150	128	80	124000	2930	36	3680	330
2004	5	31	1620	176	42	1060	128	47	47200	1530	42	5300	176
2004	5	40	32000	1860	52	2700	320	53	13200	880	30	23400	1860
2005	7	208	44400	4580	38	2790	310	41	4740	540	143	3840	530
2005	7	207	33000	3580	214	11600	1290	213	13600	3000	119	3400	490
2005	7	210	42800	4270	67	5120	545	418	20300	3690	113	5520	530
2005	7							178	7880	990	184	8020	1110
2006	3	606	22200	4040	191	4860	680	1980	17600	5020	735	7960	1620
2006	3	447	18100	3160	396	6880	740	1490	29800	6840	936	16200	2980
2006	3	487	18300	3760	378	7140	680	1410	14600	3580	741	7100	1520
Mean		**204.5**	**21445**	**2282.6**	**131.3**	**4050**	**449.25**	**470.5**	**23046.2**	**2300**	**237.5**	**6406.6**	**848.7**
Std. Dev.		**201.8**	**14684.3**	**1778.1**	**133.7**	**3204.4**	**351.2**	**678.8**	**32890.3**	**2079.5**	**313.3**	**6330.4**	**855.6**

Site index for the map on the next page.

Site Index

1-Just upstream of Bolivar WWTF outfall
2-Approximately 0.33 mile downstream of WWTF
3-Piper Ck. approx. 1.2 miles upstream of Town Br. at 435th Rd.
4-Piper Ck. approx. 0.44 mile below Town Branch at 425th Road

Impaired Segment of Town Branch of Piper Creek in Polk County, Missouri



Impaired Segment → Direction of Flow

For more information call or write:
Missouri Department of Natural Resources
Water Protection Program
P.O. Box 176, Jefferson City, MO 65102-0176
1-800-361-4827 or (573) 751-1300 office
(573) 522-9920 fax
Program Home Page: www.dnr.mo.gov/env/wpp/index.html